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CRITICAL REGIONALISM AND THE CONTEMPORARY INDIAN WORKPLACE

by

CYNTHIA LAKSHMINARAYANAN

Under the Direction of Tim Nichols

ABSTRACT

This paper represents an exploration into the expression of critical regionalism in a globalized design market. The research looks at the historical progression of Indian design and analyzes traditional concepts and patterns that can be melded with an international design language to create a design solution that speaks to both sides.

INDEX WORDS: Critical Regionalism, India, Vaastu, Interior design

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CYNTHIA LAKSHMINARAYANAN

A Thesis Submitted in Partial Fulfillment of the Requirements for the Degree of

Master of Fine Arts

in the College of Arts and Sciences

Georgia State University

2011

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INTRODUCTION

Study Goal

I believe that every country and every city has its own construction age; much like every person has his or her adolescence. During this age, people dedicate themselves to large-scale construction projects that set the form of the city or country for years to come.

Kengo Kuma¹

Modern India is coming into her prime years and must re-evaluate her long architectural and design tradition, and search for a design language better in tune with new lifestyles in an increasingly information-based economy. Every Asian country has undergone development in architecture and design during the past few decades, though at different speeds and not necessarily in the same ways. Some countries have successfully preserved their traditionalism while others have readily embraced western concepts.

While residential designs have successfully incorporated the old with the new, corporate interiors in India reflect an aesthetic that is largely westernized. There is a need to find architectural and design vocabularies that are appropriate to modern Indian lifestyles – particularly urban lifestyles – and which also draw on principles that have been found to work for generations.

By analyzing traditional virtues of Indian design, I propose to reinterpret time – honored design principles in new forms and materials that reflect a mixture of local styles and contemporary design.

¹ Kengo Kuma is a Japanese architect whose stated goal is to recover the tradition of Japanese buildings and to reinterpret it for the 21st century. More information on him can be accessed at his website www.kkaa.co.jp

Research Scope

The primary scope of this study is to identify various parameters that define an Indian aesthetic and combine that medium of tradition with a contemporary design language, without losing the meaning and attitude of the original concept. The research seeks to manipulate elements of East and West, melding together two contrasting traditions into a single program that is neither or both. A design analysis of aesthetic developments pre – and post – independence will be included. Material usage, components, reference and other tools of development will also be studied.

Methodology and Study Process

The research methodology will involve surveying the historical data and identifying key design features and patterns that can be used to create a design identity .The process includes reinterpretation and transformation of general cultural patterns (based on Christopher Alexander’s *A Pattern Language*²) to take on a new significance in the context. Finally the analysis of the design process will result in implementation of the design characteristics into a corporate office project.

² *A Pattern Language: Towns, Buildings, Construction* is a 1977 book on architecture, urban design, and community livability. It was authored by Christopher Alexander, Sara Ishikawa and Murray Silverstein of the Center for Environmental Structure of Berkeley, California. The book creates a new language, what the authors call a pattern language derived from timeless entities called patterns, which address a set of documented problems and their solutions.

HISTORY OF INDIAN DESIGN³

The architecture of India is rooted in its history, culture and religion. Indian architecture progressed over time and assimilated the many influences that came as a result of India's global discourse with other regions of the world throughout its millennia-old past. The architectural methods practiced in India are a result of examination and implementation of its established building traditions and outside cultural interactions.

Indus Valley Civilization and the Vedic Age (7000 BCE—1500 BCE)

The Indus Valley civilization, or the Harappan Culture, formed the first urban civilization on the Indian sub-continent, and one of the earliest in the world. From excavated remains, it is clear that the Indus Valley civilization possessed a flourishing urban architecture with high level of social organization. The major cities associated with the civilization, notably Mohenjo-daro, Harappā, and Kalibangan, were laid out on a grid pattern of rectilinear buildings and had provisions public spaces, a large central marketplace and an advanced drainage system.

The Harappan house is an amazing example of a native people, without the benefit of technology, adapting to local conditions and intuitively producing an architecture eminently suited to the climate. The house was planned as a series of rooms opening on to a central courtyard. This courtyard served the multiple functions of lighting the rooms, acting as a heat absorber in summer and radiator in winter, as well as providing an open space inside for

³ The information on Indian architecture in this chapter is from the following books. Dan Cruickshank, ed., *Sir Banister Fletcher's A History of Architecture* (Oxford: Architectural Press, 1996). Charles L. Fabri, *An Introduction to Indian Architecture* (New York: Asia Publishing House, 1963). E.B. Havell, *Indian Architecture, its psychology, structure, and history from the first Muhammadan invasion to the present day* (New Delhi: S. Chand, 1913).

community activities. There were no openings toward the main street, thus ensuring privacy for the residents. In fact, the only openings in the houses are rather small – this prevented the hot summer sun from heating the insides of the houses.

For monumental architecture, the evidence is slight, the most important being a “sacred” tank (thought to be for ritual ablution) and associated structures. Corbel vaulting (arches supported by brackets projecting from the wall) was known, and, to a limited extent, timber was used together with brick; whatever architectural ornamentation existed must have been of brick or plaster.

Eventually the population of this civilization migrated further south into peninsular India to escape the attacks of the Aryan invaders. Curiously, the Aryans did not settle into the well-planned cities of the Harappan culture, and instead preferred to clear forests around the riverbanks of the Gangetic plain and settle in small villages. No architectural examples of this period are surviving but considerable information is given in the Vedas. Documentation shows that the barrel vaulted roof, the tie – cord, and the palisade fence and railing were developed during this period, and continued to be important motifs for future Indian architecture.

Post Maha Janapadas Period (1500 BCE—200 CE)

The Buddhist stupa, a dome – shaped monument, was used in India as a commemorative monument associated with storing sacred relics. The form chosen for the Buddhist stupa was that of a sphere – as much for the shape's metaphysical associations as for the fact that it was an antipode to the square/rectangular form of Hindu temples. With the spread of Buddhism, the stupa architecture was adopted in Southeast and East Asia, where it became prominent. Eventually this architectural feature became known as a pagoda to the people from the Western world. The most prominent of these stupas was at Sanchi, near modern Bhopal.

The Sanchi Stupa is basically a dome, surmounted by a finial or *harmika*, with a circumambulatory path around it, delineated by a railing or *vedika*. Guardrails – consisting of posts, crossbars and a coping – became a feature of safety surrounding a stupa. The *harmika* on top represented the Bodhi Tree under which the Buddha first gained enlightenment. A natural consequence was the gradual development of a large complex of buildings around the stupa. These were typified by the *vihara* and the *chaitya*.

The *vihara* evolved from the humble cave dwellings of the monks. In plan, it essentially consisted of a large number of cubicles around a large central courtyard. The *viharas* were models of austerity, with drab exteriors and bare interiors. The *vihara* was basically an extension of the urban dwelling with its open-to-sky courtyard and surrounding rooms. The courtyard served as a community space, while the cells provided sufficient privacy for effective meditation.

The *chaitya* hall evolved due to the fact that the Sanchi stupa was an outdoor structure – not permitting use in adverse weather. Hence the evolution of the *chaitya* as a sort of indoor stupa. An examination of the *chaitya* hall architecture reveals the same determinants as in Vedic village architecture – the barrel vaulted roof, the horseshoe-shaped entrance and railings echoing the palisade walls outside Aryan villages. The craftsman, unfamiliar with the structural properties of stone, reverted to familiar forms, reproducing in stone what was done earlier with wood despite the greater effort involved. This is a recurring feature throughout the history of Indian architecture - the lead time required before a new material is finally put to the best use possible, given its natural properties.

Meanwhile cave temples became prominent throughout Western India, incorporating various unique features to give rise to cave architecture in places such as Ajanta and Ellora. Walled and moated cities with large gates and multi-storied buildings that consistently used

arched windows and doors are important features of the architecture during this period. Buddhist architecture blended with Roman and Hellenistic architecture to give rise to unique blends – such as the Greco-Buddhist school, especially evident in sculpture and art. Little literary evidence exists to confirm this influence on architecture but some scholars have nonetheless suggested a possible relation based on similarity of architectural styles.

Middle Ages (200 CE— 1526 CE)

With changes in the political climate, Buddhism suffered from a lack of political patronage during this period, leading to its slow decline. Also notable was a corresponding slowdown in the arts and literature. Thus, in its effects, this period in Indian history may be said to be analogous to the end of the Greek empire in Europe.

Eventually, a large part of the country came under the political control of the Gupta dynasty, which reached its zenith around 400 AD. The culture of the Guptas and their innate Brahmanism revived the arts, and in the field of architecture variety in form and richness in decoration was widely explored. Architecturally a break from the mere copying of forms carrying over from wood construction, to a new sensitivity in the handling and use of stone was achieved. This is the first time that the use of dressed stone masonry is made, a major step in the evolution of building construction. With this, a radically different type of architecture began to evolve, notably in temple architecture.

Unique principal architectural features defined the temple.⁴ The sanctuary as a whole is called a *vimana*, and the pyramidal or tapering roof above this is called the *shikhara*. Inside the *vimana* is a dark chamber, the *garbha-griha* (literally the 'womb-house') accessed through a

⁴ Ashish Nangia, " *Poetry in Stone: Crystallization of The Hindu Temple*," www.boloji.net/architecture/00006.htm (17 March 2010)

doorway on one side. In front of the doorway is a pillared hall, or *mandapa*, which serves as an assembly for devotees. In some examples the *mandapa* is detached from the *vimana* by an open space. Leading up to the *mandapa* is a porch or *ardh-mandapa*. The entire temple complex is enclosed by a boundary way essentially forming a courtyard.

The characteristic form of temple architecture is the result of repetition of motifs. For example, the *shikhara* is made up of the same miniature fractal form repeated multiple times. In fact these repeating motifs in themselves are considered miniature shrines. Two main types of motifs/mini – shrines exist, depending on the geographical location of the temple. These two types make up the Indian temple 'orders,' and are called the Dravida, found mostly in the south, and the Indo-Aryan, in the north.

Indian temple architecture has often been called sculpture on a mass scale rather than true architecture. This is because there was little structural inventiveness or technical ingenuity. No attempts were made to solve the problems of spanning large distances by the use of the arch, vault or dome, which were by this time common in other parts of the world. Instead the Indian mason relied on gravity and mass for his structure to stand, and the piling of massive blocks one on top of the other ensured stability without using mortar. However, the finished structure showed a fine appreciation of mass and the value and effects of shadow to a marked degree.

Two institutions that greatly influenced temple construction brought about this close coordination. The first was the *seni*, or guilds. Initially a system of apprenticeship, the guilds slowly became hereditary, and knowledge of temple construction and sculpture was passed down through the generations from father to son. A large project necessitated a guild being obliged to settle on the site for a long period, sometimes a generation or more. Thus a large architectural undertaking became an art center from which a local school and style were derived.

The second influence was that of the *shilpas*, treatises codifying rules for art, sculpture and architecture, and in particular the *Vaastu shastra*, a book setting down the rules of architecture. Thus the workmen had standardized rules, which by following they could be assured of success.

Islamic Influence and Mughal Era (1526 CE-1857 CE)

The early interaction of Islamic invaders did not make a great impression on Indian architecture. When the Muslims were no longer seen as invaders and finally assimilated as Indians, the emperors built palaces and forts absorbing the local materials and forms of pink sandstone, marble and *pietra dura* inlay work. Indian Islamic architecture is different from Islamic architecture in other countries, for though a Muslim may have designed the structure, the entire construction work was carried out by native Indian craftsmen, who successfully managed to integrate old Hindu decorative elements with characteristically Islamic motifs. Islamic design was distinguished by a focus on pure outline and color rather than by the plastic treatment of surfaces or the massing of forms for contrast of light and shade in which Hindu architecture asserted itself.

During the Mughal period there were further refinements in the use of materials. Different materials like pink sandstone and white marble were used together successfully with the white used to emphasize, surround and underline every architectural form, to frame doorways and windows, and to strengthen the design rather than just ornament it. Buildings start to have a more rhythmic structure, partly in their symmetrical design and partly in the repetitive nature of the forms used, such as the arches of the large doorways reflected in the smaller windows, false or true. Palaces move away from fortified appearance and become more open, along Hindu construction principles, incorporating large verandas, overhanging *chajjas*, *jali* (latticed) screens.

The impact of Imperial Mughal style has been especially enormous. From the 17th century onwards, all Hindu architecture is profoundly influenced by this Indo-Islamic style; arches are widely used instead of the usual trabeated construction, curvilinear roofs, oriel windows, pavilions and domes become more commonplace in palaces and forts.

Colonial Era (1857 CE—1947 CE)

Colonial architecture is seen as a visual embodiment of British confidence and power, as a conscious attempt to commemorate British rule with monuments of permanence and grandeur. British building in India was dominated by Renaissance classicism, a tradition that, in various permutations and combinations, had been adopted throughout Europe and exported wherever European settlements existed. Although the design of colonial architecture was British, its construction was dependent on local materials and craftsmanship. Just as Indian craftsmen, at the time of the Mughal invasion, had adapted their techniques to Islamic arches and domes, they accommodated as best they could to the demands of classical columns and pediments. The classical tradition had a long and pervasive influence in India, but nineteenth-century colonial building reflected a wide range of European revival styles, from the Italianate to the Gothic, such as Greco-Roman temples for banks and clubs, Palladian buildings for private residences, Neo-Romanesque for offices and Neo-Gothic for churches and other public buildings.

One of the major differences between British and Indian architecture lay in the realm of interior furnishing. The British equipped their interiors with a variety of bulky objects but the Indians had managed for centuries with only minimal domestic furnishings. The character of the Indian house was defined by its proportions, polish of its walls, frescos around the dado, niches in the walls, elaborate carved doors and projecting beams and pillars of the veranda. This lack of heavy furniture gave considerable flexibility to the use of interior spaces. British policy in India

encouraged a process of westernization within the upper class of the society. It was inevitable that British styles would modify and in some ways replace Indian tradition. In the case of urban houses, Indians retained the traditional plan of the courtyard dwelling, incorporating a classical portico facing the street and an internal courtyard surrounded by colonnaded loggias. In basic form, such houses resembled an Italian palazzo more than any British prototype. The adoption of Western architecture brought with it the acceptance of Western interior furnishings and, consequently, living patterns.

The British sought as well to place themselves in the line of the great Indian empires of the past, and so, during the later decades of the nineteenth century, set about creating a style of building Indian in appearance, but Western in function. This came to be known as the Indo–Saracenic style. Behind this revivalist enthusiasm lay the Arts and Crafts movement of later nineteenth–century England, which extolled the craftsman or artisan as a builder. In response to this movement the British sought to employ the creativity of the traditional Indian craftsman. The Indo–Saracenic style gained further impetus from its close association with the Gothic. Though the two had of course a wholly different origin, they shared an exuberant surface decoration, arched gateways and other features; and these provided sufficient superficial similarity so that the taste for one style reinforced the acceptability of the other. The Indo–Saracenic style was primarily seen on the facades of buildings and did not apply to the interior. Indo–Saracenic buildings were characterized by a composite mixture of various architectural elements and details, such as bulbous domes, overhanging eaves, pointed, cusped or scalloped arches, and made no attempt to be faithful to the stylistic canons of any period of India's past. By 1900 Indo–Saracenic had become almost universally accepted as the appropriate style for substantial public building in India. In the process the Indo–Saracenic builders reshaped India's

view of its architectural heritage. What had been a loosely structured tradition carried forward by artisans working under the patronage of local princes was transformed into a consciously ordered 'traditional' architecture, its elements all arrayed before the prospective builder.

Republic of India (1947 CE—present)

The British architectural legacy in India represented far more than monuments, it included a continuing receptivity to Western ideas. For many Indian architects, national independence implied not a turning inward, but expanding opportunities to participate in a world design community characterized by shared ideas and a common aesthetic sensibility. Far from rejecting westernization, it was equated with progress in anticipation of an era of technical advancement and industrial prosperity. Modern architecture was seen as the architecture of democracy. The rhetoric of modernism stressed not on style but a presumably rational approach to design unhampered by historical or cultural constraints.

The building of Chandigarh and the Indian Institute of Management by Le Corbusier and Louis Kahn, respectively, though controversial, seemed to embody a vocabulary of powerful architectural images that were in many ways timeless and universal. Their use of materials, moreover, gave their work certain suitability to India. In a land where building maintenance was often lacking, and where surfaces were subject to strong weathering, brick and concrete seemed feasible alternatives to the smooth, plastered surfaces of the International Style and Art Deco. The impact of Le Corbusier and Kahn has since influenced the aesthetic sensibilities of generations of architects in India. The expanded formal range of modernism suggested a new compatibility with Indian tradition. Modern buildings could now incorporate thick walls, rough surfaces and restricted fenestration.

A conspicuous feature of the post-independence era was the introduction of the skyscraper into India. Skyscrapers seemed the inevitable fruition of modern technology despite their costliness, technical problems and cultural inappropriateness. Gradually the landscape of the Indian city moved away from the bungalow style with its open spaces and verandas to a skyline that was punctuated with buildings of no common character or concern for local requirements. The post-independence architectural achievement had proved disappointing to many, with the rapid rise of indiscriminate building in cities that eventually set the urban language of the nation.

When Western classicism was introduced in India, its proponents were convinced that it was based on fundamental principles of order. The Gothic Revival embodied a message of craftsmanship and creative expression. The International Style and Art Deco carried associations of technical advancements and social progress. Each succeeding wave of influence had encompassed a relatively consistent ideology and style. At present the Indian metropolis seems to retain its hybrid form.

PATTERNS AND PRINCIPLES OF A DESIGN LANGUAGE

A pattern can distill the wisdom of the past; reveal the potential of the future, and link with other patterns to form a language to guide a process. Patterns help us consider the essential elements as we undertake the creation of something new or the evaluation of something old.

Max Jacobson et al⁵.

Visual design principles apply to all areas of design and need to be acknowledged and implemented to create a successful aesthetic language. The universally present visual design principles are balance, proportion, rhythm, emphasis and unity.

Balance creates visual stability and relates to our physical sense of equilibrium. It is a reconciliation of opposing forces in a composition that results in visual stability. It may be symmetrical / formal or asymmetrally / informal.

Proportion refers to relative sizes within structures, which is used to elicit a response from the users in relation to their surroundings. For instance, government buildings, theaters and churches are often built to impress and dwarf the viewer, while the proportions in a private home are usually in accordance with the human measure.

Rhythm is achieved through repetition of shapes within buildings. Rhythm depends largely upon the elements of pattern and movement to create its effects.

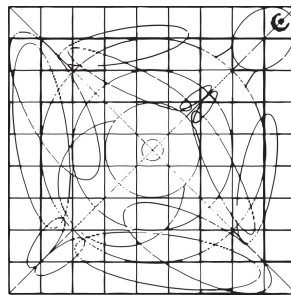
Emphasis is achieved through contrast by creating a focal point to attract attention. It is essentially a break in the rhythm, prompting visual awareness.

⁵ Max Jacobson, Barbara Winslow, and Murray Silverstein. *Patterns of Home: The Ten Essentials of Enduring Design* (Connecticut: Taunton Press, 2002). Coauthors of A Pattern Language, Jacobson, Winslow and Silverstein further simplify building design by distilling ten essential patterns for residential homes.

Unity is defined in the way an interior environment is structured to create a visual harmony. It is the underlying principle that summarizes all of the principles and elements of design. It refers to the coherence of the whole as a single concept.

In addition to these universal principles, in order to define regional concepts, there is a focus on the traditional virtues of Eastern design: the manipulation and articulation of space largely defined by the science of Vaastu and the expression of what is essential in a structure or interior.

Vaastu Shilpa Shastra⁶



Vaastu Shastra is the classical Indian treatise of architecture known for its in-depth analysis of all aspects of building and sculpture. It is akin to a pattern language study upon which an entire system of building tradition has been developed. It is based on a fundamental premise that the earth is a living being, and the life force contained within it is called *vastu*. Each living being or *vastu* is placed on a plane of support called *Vaastu*. *Vaastu* is interpreted as the earth, an individual site or land, and includes in practice the built form. Space, time and energy are

⁶ The information on Vaastu Shilpa Shastra in this chapter is from the following books. Sashikala Ananth. *The Penguin Guide to Vaastu: The Classical Indian Science of Architecture and Design*. (India: Penguin Books, 1999). Vibhuti Chakrabarti. *Indian Architectural Theory: Contemporary Uses of Vastu Vidya*. (Surrey: Curzon, 1998).

traditionally perceived as existing in a free, unlimited state. When space is transformed into form, time anchored into the present, and energy tuned to the natural energy flow of the human being, an organic link is established between the individual and his or her environment. The Vaastu Shastra devised an order pertaining to this creation of manifested space and set down defined principles of good planning and design, where the inner order of the vibrations produces the outer order of manifested form.

Vaastu Shastra has its roots extended in Indian philosophy, mathematics, geology, Geography, and also takes into account factors influencing a site, such as topography, roads, surrounding structures, the effects of the sun, Earth's magnetic field, cardinal directions, Earth's energy fields and the elements of Nature.

Vaastu Principles

Site orientation:

Orientation has always played a very important role in building because of the environmental factors that affect man and his surroundings, such as the monsoon rains, the summer heat and the winds. Taking these factors into consideration Vaastu Shastra references the cardinal directions while laying down guidelines for construction.

The most frequently used rooms during the day are oriented in the East and the North whereas the rooms that are used mostly at night are restricted to the South and the West, which are hotter directions. Open wells and other water sources are kept in the North–East to take advantage of the constant light and to prevent the contamination of a vital water source. Trees and tall shrubs are planted in the South and West of the site to protect the occupants from the

afternoon sun, while they are avoided in the North and East so as to allow an unhindered flow of useful morning light into the house.

Site planning:

The *Vaastu Purusha Mandala* is a 9 x 9 metaphysical square plan that illustrates how Brahma and 44 Gods pinned down the Vaastu Purusha – face down, with his head to the Northeast and his feet towards the Southwest. These symbolic Gods rule various aspects of life and have certain inherent qualities. The function of the rooms placed in each area of the house was in accordance with the nature of the deity ruling that particular area.

Though the story of the Gods indicates superstitious beliefs, the Mandala is actually based on manipulating the five basic elements, the eight directions and the sun and the earth's energy fields to create a balanced environment that ensures proper ventilation, lighting and a better quality of life.

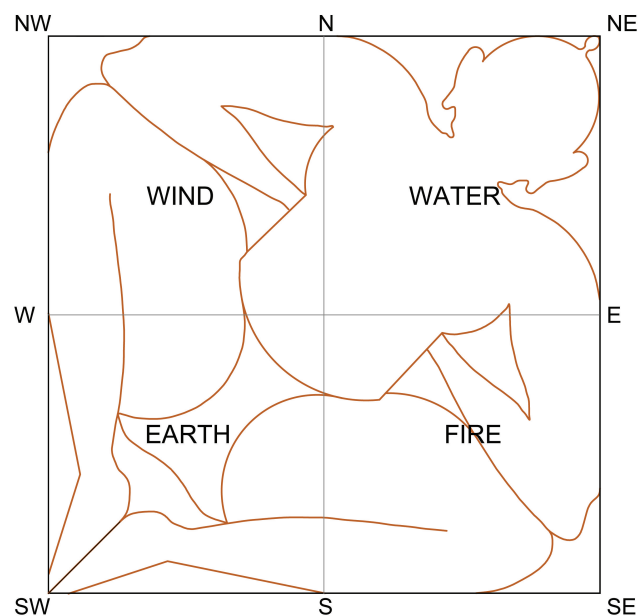


Figure 1 - Vaastu Purusha Mandala

Taking into consideration that humans perform diverse activities at different times of the day, the 24-hour day is divided into eight parts, representing the eight directions. The space is then planned and oriented towards these directions to ensure that at any given time of the day, depending on the activity, the occupants benefit from the presence of natural light. Traditionally the positioning of rooms would be as follows:

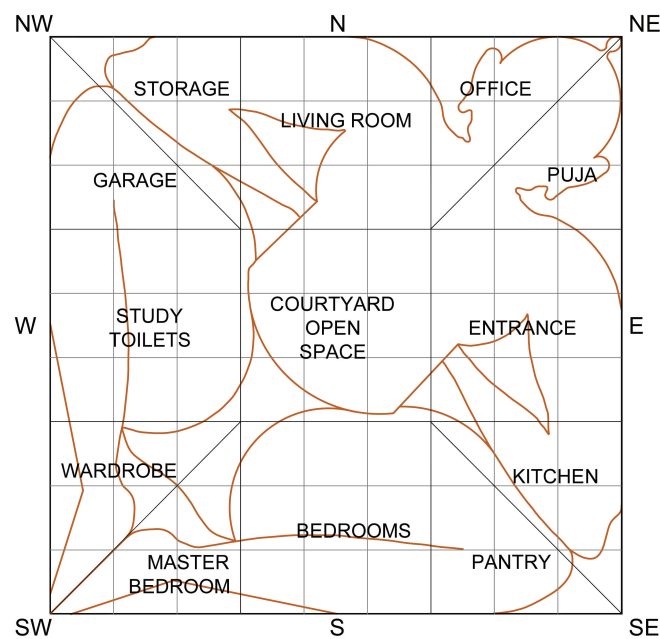


Figure 2 - Typical layout using Vaastu Purusha Mandala

East, ruled by the Sun god, Surya – Main entry: The East, from where the Sun rises, represents the essence of all beginnings. Vaastu recommends that the main doors and windows of a house face East, both as a sign of veneration to the Sun and also a way to benefit from the sunlight and air entering the building in the early morning.

North, ruled by the god of wealth, Kubera – Living room and office: The North is the direction of the Pole star, the fixed point in the sky that denotes stability and security.

Traditionally homes with a shop front had the store oriented in this direction to benefit from the constant northern light, which in turn ensured profit through business. Living rooms, being the most occupied space during the day, are thought to be best situated in this quadrant to harness the readily available light.

West, ruled by the god of the sky, Varuna – Restrooms and storerooms: The setting sun is reminiscent of endings, the unknown and darkness. Enclosed rooms like storage spaces are placed in this quadrant, as they are not constantly occupied. Also the west wall retains the late evening heat and may be uncomfortable to sleep in, therefore rooms like restrooms are placed here, which may in fact stay drier due the prolonged heat retained.

South, ruled by the god of death and responsibility, Yama – Guest and children's bedrooms: The South represents the past and our ancestry. This side does not get too heated up nor is it too cold at night and hence is the ideal place for bedrooms. By avoiding open spaces and balconies, the sunlight reflected from the West to this direction is obstructed.

Northeast, the direction of water – water source: This being the corner where the North and East directions meet, it is the ideal place to have open space so that there are no obstructions to the sunlight from the North and the morning light from the East. It also makes sense to have the water source, traditionally an open well, here, as there is available open space and the sunrays can purify the water. Obviously, it is not advisable to have toilets or a garbage pit near the water source.

Northwest, the direction of wind – Restrooms, garages, pantry: As the North-West side also gets heated up by the evening sun, infrequently occupied rooms like the restrooms garage, pantry, when placed here, serve as a buffer and prevent the rest of the house from heating up.

The heat keeps these rooms dry and free from moisture and mold, making them the ideal place for storing food grains.

Southwest, the direction of earth – Master bedroom, safe: This being the corner where the South and the West meet, it is best to have a Master bedroom as the room can get good cross ventilation at night. Since the master bedroom is sure to be occupied, it makes sense to store one's valuables here. Also, the wardrobes on the West wall help reduce the heat transfer.

Southeast, the direction of fire – Kitchen: This is the corner where the South and East directions meet and is also the direction of heat and high levels of energy. Exposure to sunlight and protection from the Southwest winds makes this an ideal location for the kitchen. The Southwest winds were taken into consideration as in earlier times the cooking was done in an open area.

Proportionate Measurements:

Maana is the Vaastu Shastra principle of proportionate measurement. According to Vaastu Shastra, the ratio of height, length and breadth are most important to create an aesthetically proportionate three-dimensional building. The following ratios were thought to create the most aesthetic proportions progressively.

Ratio of 1: When the height is equal to the breadth, the structure is considered to be aesthetically proportionate.

Ratio of 1.25: When the height is 1.25 times the breadth, the structure is considered to have good stability.

Ratio of 1.5: When the height is 1.5 times the breadth, the structure is considered to have a pleasant appearance.

Ratio of 1.75: When the height is 1.75 times the breadth, the structure will appear both strong and beautiful.

Ratio of 2: When the height is twice the breadth, the structure will appear majestic.

Ayadi is the principle of dimensions. Though the science of Vaastu follows generic rules for the design of spaces, a specific set of six formulae called *Ayadi* are used to work out the length, breadth, perimeter, area and height of the building. Today, *Ayadi* is the only aspect of Vaastu Shastra that is followed in many parts of India.

Ayadi constitutes six formulae: *Aaya*, *Vyaya*, *Yoni*, *Raksha*, *Vara* and *Tithi*. The remainder obtained by using these formulae determines whether it is a gain or loss. If it is a gain, then the structure is proportionate and stable and the dimensions are right. However if it is a loss, then it means the dimensions are not right and should be suitably corrected. This was largely useful in preventing wastage of standard-size materials like tiles.

1. **Aaya** is the remainder of length x 8 divided by 12
2. **Raksha** is the remainder of length x 8 divided by 27
3. **Vyaaya** is the remainder of breadth x 9 divided by 10
4. **Yoni** is the remainder of breadth x 3 divided by 8
5. **Vara** is the remainder of height x 9 divided by 7
6. **Tithi** is the remainder of height x 9 divided by 30

The *Ayadi* formulae are useful to fix the lengths, breadths and heights of residential and business buildings, layouts, religious buildings etc. as explained below:

LENGTH: *Aaya* and *Raksha* formulae are used to fix the length of the building/rooms. *Aaya* means income and *Vyaya* means loss or expenditure. Therefore, the *Aaya* should always be greater than the *Vyaya*. Using the *Aayadi* formulae it has been concluded that for the *Aaya* to be more than the *Vyaya* the length of rooms/building should preferably be 1.5 times the breadth or at least 1.375 times the width. This is why sites in India are generally rectangular with a length 1.375 – 1.5 times the breadth. For example, sites have dimensions of 40 x 60, 30 x 40 and 50 x 80.

BREADTH: The *Yoni* and *Vyaya* formulae are used for fixing the breadth of the building. If the remainder obtained in the *Yoni* formula is an odd number, then it is good whereas if it is even, then it is considered bad *Yoni*. 1, 3, 5 and 7 remainders are considered good *Yoni* and associated with the directions East, South, West and North, respectively. Therefore depending on the direction the building faces, the corresponding *Yoni* should be used to fix the breadth of the building/rooms.

ORIENTATION: The *Yoni* formula defining the breadth measurement is useful for buildings that are not oriented to the cardinal directions. Vaastu Shastra clearly emphasizes the importance of orienting the buildings to the four cardinal directions (North, East, South or West). As far as possible, buildings should not be oriented to the intermediate directions. But in rare situations, if the site faces an intermediate direction, the *Yoni* formula should be used so that the remainder is 1. The reasoning behind these numbers was based on the monsoon winds and other climatic vagaries. When buildings are oriented towards the cardinal directions, they withstand the impact of these natural energies and could even harness them effectively. This is why most religious buildings, palaces, cities, villages and roads of ancient India have been found to face the cardinal directions. If it was not possible to orient the building to the cardinal directions, the *Yoni*

calculations were used to determine the best dimensions for the building to be able to withstand the forces of nature.

HEIGHT: The height of the building can be fixed using the *Vara* and *Tithi* formulae. The height of the first floor should not be more than that of the ground floor.

The theories of Vaastu can be applied in infinite ways as long as there is an understanding of the underlying concepts, which can be summarized as follows:

- **Response to the built space** – Understanding the function and aesthetics of the space so as to effect a positive response in the viewer or occupant.
- **Form and center** - Awareness of the connection between the occupant, uncontained space and the building. Within the manifested form, experiential foci must be established according to the activity in order to anchor the energies.
- **Natural environment and symbols** – When the form relates to the basic elements and symbols of a cultural environment, a connection is created between the occupants of the built space and their subconscious. In the contemporary social system it is important to establish a symbolic connection between people and their natural environment.
- **Significance of orientation** – When there is a need for a location to perform any given activity, there should be no hesitation in the occupation of such a location. There is a hesitation in this intuitive choice-making process only when there is perceived uncertainty or discomfort. The geographical directions play a significant part in this intuitive response. The energies that exist in the environment, though not tangible, trigger memory patterns with each of us that influence the choices we make.
- **Importance of cosmology** – Any given physical space can be perceived in its connections with the primary energies of the eight directions. Each direction has its own

identity based on the presiding *Deva*, its symbol, color and element. It is believed that a division of physical space in a site into its cosmological pattern creates a connection between the building and its environment

	NORTH Diety: Kuber Identification: Wealth and Health	
WEST Diety: Varuna Identification: Unknown Darkness		EAST Diety: Surya Identification: Enlightenment Inspiration
	SOUTH Diety: Yama Identification: Death, Duty, Responsibility	

Figure 3 - Cardinal Directions

NORTHWEST Diety: Vayu Element: Air		NORTHEAST Diety: Isa Element: Water
	CENTER Diety: Brahma Element: Space	
SOUTHWEST Diety: Pitri Element: Earth		SOUTHEAST Diety: Agni Element: Fire

Figure 4 - Intermediate Directions

- **Importance of shape and proportion of the built form** - Each physical form is a composition of three *gunas* or characteristics known as *satvika*, *rajasa* and *tamasa*. When one of these *gunas* is predominant, then the nature of the material object takes on the dominant character and influences the hidden potential, a concept that is understood with regards to the human body with the practice of yoga.

Satvika is the luminous, meditative quality represented by a square or a rectangle. It is the pure intelligence of the consciousness.

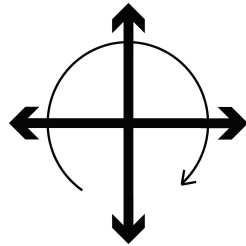
Rajasa is the vibrant, energetic, active element represented by a polygon. It is the inner urge to achieve.

Tamasa is inertia, the aggression represented by the circle and ellipse. It is the resolve to hold back and gather the weight of self for action outside.

Rajasa being powerful is positive, but when the system demands a great deal of aggression to get something done *Tamasa* is required. When the context needs to be understood with tranquility then *Satvika* must be predominant.

The energy contained within the square and rectangle is most stable, restful and in equilibrium. The energy contained in a polygon is in movement and greater than that within a square. The energy contained in the circle is very high and considered aggressive, stimulating the occupant to a high degree.

The Flow of Movement



In India, temple towns and the temples themselves are planned to direct movement and direct lines of sight. Spatial analysis of the plans of temple towns throughout South India provide evidence of directed access and flow of people through space, directed lines of sight, and physical changes in these pathways as one moves through them in ritualized patterns. Paths of movement are directed and lines of sight are concentrated on particular features to emphasize the monumentality of temples. Directed routes control access in the city, separating public from private space, or one part of the city from another. Circulation and circumambulation are fundamental elements of Hindu pilgrimage.

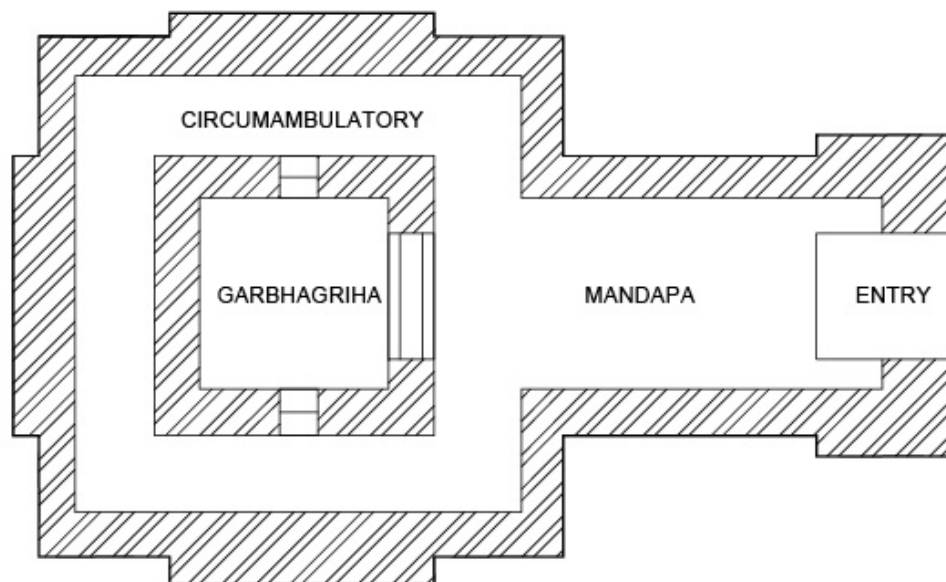
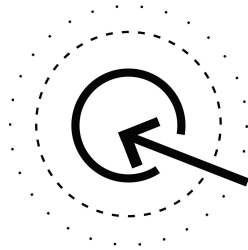


Figure 5 - Circulation paths defining the flow of movement within a temple

Intimacy Gradient



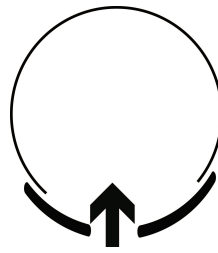
Traditional homes in India have a clearly demarcated gradient between public spaces and private spaces. At the entrance of house, there is an open porch that is in constant dialogue with the street. Homeowners can carry on conversations with passers-by without having to invite them into their homes. Expected guests, depending on their familiarity, are welcomed either into a transitional space that also functions as a formal living area or into the less formal gathering spaces within the heart of the house. Spaces such as the bedrooms and kitchen are kept private with access only to family.



Figure 6 - Stages of accessibility defines a gradient of intimacy

Image source: *Vaastu House*, Bangalore, India. Digital Image. Available from: Khosla Associates, <http://www.khoslaassociates.com/main.html> (accessed October 9, 2010).

Main Gateway



A door to a house or a gateway into a city marks the physical boundary at the end of one kind of place and the beginning of another. The gateway is more than just an entry; it is a solid element that is visible from the line of approach, creating a feeling of transition by allowing a change in light, surface or level. The gateway addresses the relationship between street-to-entrance patterns focusing around the social connection to the outside while suggesting privacy.

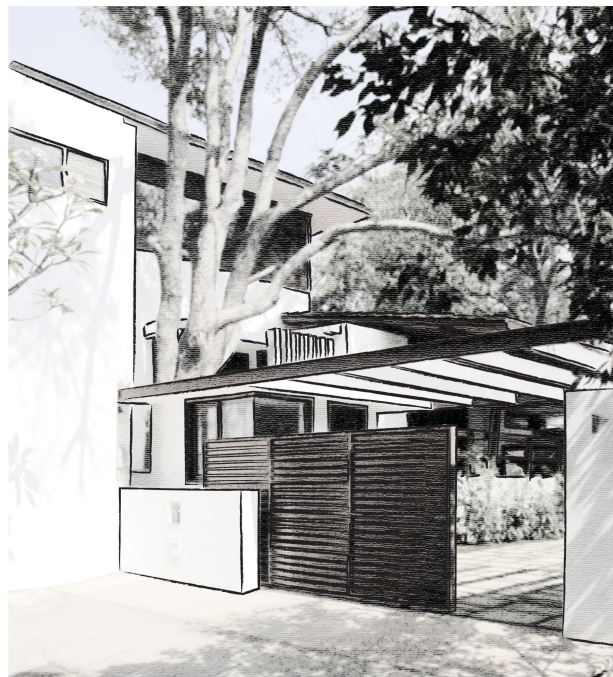
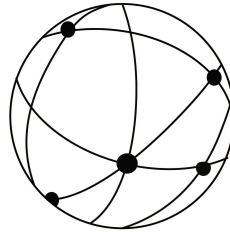


Figure 7 - A defined entry signifies the transition between the outside and the inside

Image source: *Vaastu House*, Bangalore, India. Digital Image. Available from: Khosla Associates, <http://www.khoslaassociates.com/main.html> (accessed October 9, 2010).

Informal Activity Nodes



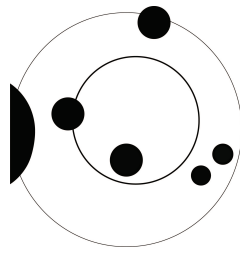
The most commonly identifiable expression of a node is a courtyard. Seen as an integral feature in traditional Indian architecture, the courtyard serves as host to many activities and at the same time it remains spatially interesting on its own. In public areas, common gathering spaces serve as nodes that interlace each spatial cluster into the larger community. Nodes are distributed across the community such that a constant tension exists between ‘active’ and ‘passive’ areas. They serve as centers of visual and cultural connectedness, where one can see and be seen, increasing the fluidity of one’s spatial awareness.



Figure 8 - Internal courtyard serves as an informal activity node

Image Source. *Vaastu House*, Bangalore, India. Digital Image. Available from: Khosla Associates, <http://www.khoslaassociates.com/main.html> (accessed October 9, 2010).

Spatial Cluster



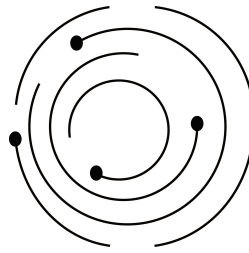
Indian villages are characterized by a clustering of private spaces around a public space, and in many ways these spaces have evolved into the towns and cities of the modern day, incorporating the same architectural culture rooted within its people. The natural clustering of buildings creates a close sense of community that is undeniably Indian. Spatial cluster within each area serves to draw people together and create a micro community within the larger community. A natural limit to the cluster pattern arises entirely from the balance and flexibility that exists in every community.



Figure 9 - Grouping defines the spatial cluster within a community

Image source: Jefferybeaumont, *The Village of Dakshinchitra*. 2008, Digital Image. Available from: Flickr, <http://www.flickr.com/photos/jeffreybeaumont/3064873685/in> (accessed January 19, 2011).

Degrees of Privacy



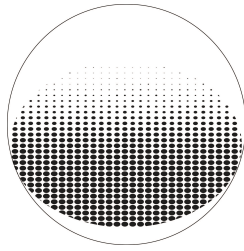
The basic human personality of the Indian culture is community-loving versus privacy-loving. Within the community, the available public life is so concentrated that there is constant action and interaction so much so that there is no defined need or desire for private space in public. As a culture Indians thrive in areas that offer visual and personal connectedness and are able to create their own mental quiet amid the chaos around them.



Figure 10 - An open community promotes constant interaction

Image source: *Crowd at Delhi's Pragati Maidan*. 2010, Digital Image. Available from: The Hindu, <http://www.hindu.com/2010/11/22/images/2010112261060401.jpg> (accessed January 19, 2011).

Play of Light



If light is essential, shadow is the complement that enhances it. In Indian vernacular architecture, a typical architectural expression arises from the response to a functional need. This notion is best illustrated in the use of *Jalis*. In a social context, the *jali* was used as a screen to ensure privacy from the outside while allowing the occupants visibility to the outside. It served to protect from the strong daylight, but its perforations also helped naturally ventilate the spaces within. By nature of its solid and void pattern, the light filtering through created patterns of light and shade on surfaces that changed with the passing of the day.

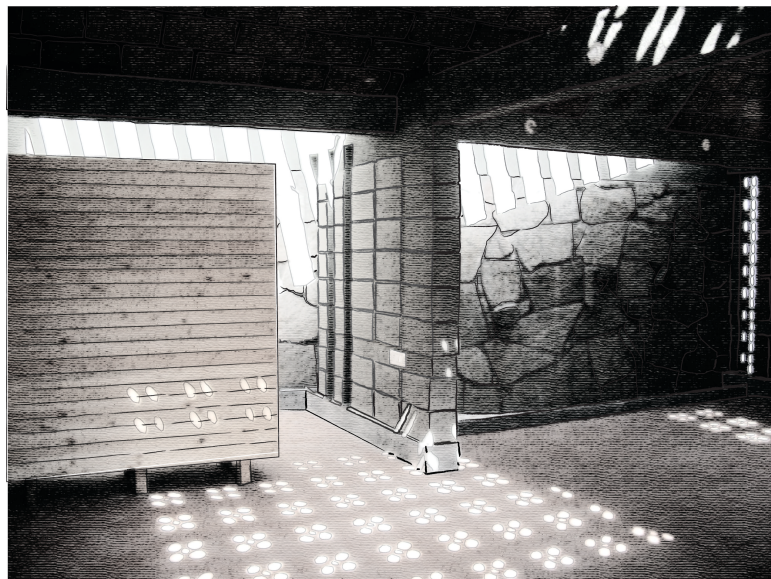


Figure 11 - Light and shadow add to the depth in the perception of space

CRITICAL ANALYSIS OF AN INTEGRATED DESIGN PROPOSAL

If you spend eight hours of the day at work, and eight hours at home, there is no reason why your workplace should be any less of a community than your home.

Christopher Alexander: *A Pattern Language*.⁷

The contemporary Indian office is a relatively new type of space that has been in existence for the past decade or so. As there are no past work patterns that one can look toward, the proposal draws parallels from the society and seeks to position the workplace as a reflection of the community.

In order to illustrate the patterns identified, the analysis is done on a generic floor plan of a commercial building that is purported to be in India. The building is occupied by a fictional IT company that has an organizational hierarchy of 3 executive officers, 14 managers, 8 team leaders, 158 team members and 10 interns/floating population. While the case study is done on an IT firm the design can extend to other types of businesses too. The patterns are laid out as a sequence, starting with those that are most apparent in space planning, leading into those that affect one's experience within the built space. Each pattern flows into the other and together forms an overall aesthetic.

⁷ Christopher Alexander, Sara Ishikawa and Murray Silverstein, *A Pattern Language: Towns, Buildings, Construction* (New York: Oxford University Press, 1977).

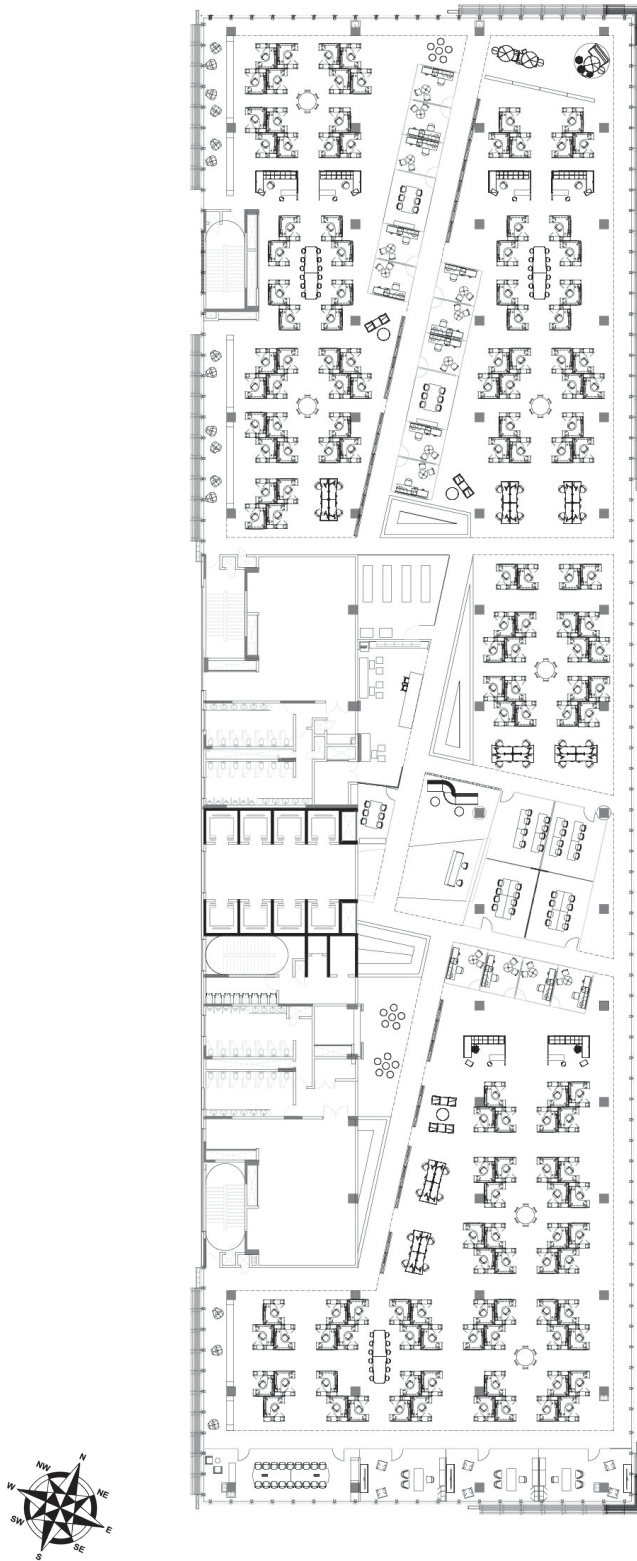


Figure 12- Floor plan of conceptual space

Vaastu Shilpa Shastra

While it is not possible to follow the principles of Vaastu completely when addressing the interior, there is much emphasis on planning spaces in such a way that all rooms get maximum benefit of sunlight. Thus the East direction and the North direction (from where there is constant sunlight throughout most of the year in India) assume a lot of importance. Enclosed spaces are kept away from these facades so that there is no hindrance to the light flowing through the larger workspace. Communal spaces like the library, which can be utilized by all members of the office, are located in these quadrants. Spaces that require enclosure like the restrooms and building services are restricted to the South and the West, which also serve to absorb the latent heat toward the end of the day.



Figure 13- Library placed at the Northeast corner opens up the floor space to unhindered natural light as per Vaastu.

The Flow of Movement

How we enter a space and move through it has profound influence on our sense of the building. The entire sequence of movement through and around a space along with places of pause determines the level of comfort and intuitive familiarity experienced.

The flow of movement has been based on the general loop pattern within a temple complex where the main path of circulation is aligned with the sacred chambers along the cardinal and ordinal directions, with a passage for circumambulation in a clockwise direction. The main circulation within the office is oriented along the North–South axis with a circumambulatory pathway provided along the periphery of the entire floor space. The main paths of circulation are laid out to move along the edges of the central spaces and the secondary circumambulatory path connects one to the other services, while creating a possibility to come and go in two different directions within any given space. A loop in the flow of movement establishes a feeling of generosity of light and movement. As in a temple the paths of movements are also help direct lines of sight as one moves through the space allowing them to experience the space as a whole.

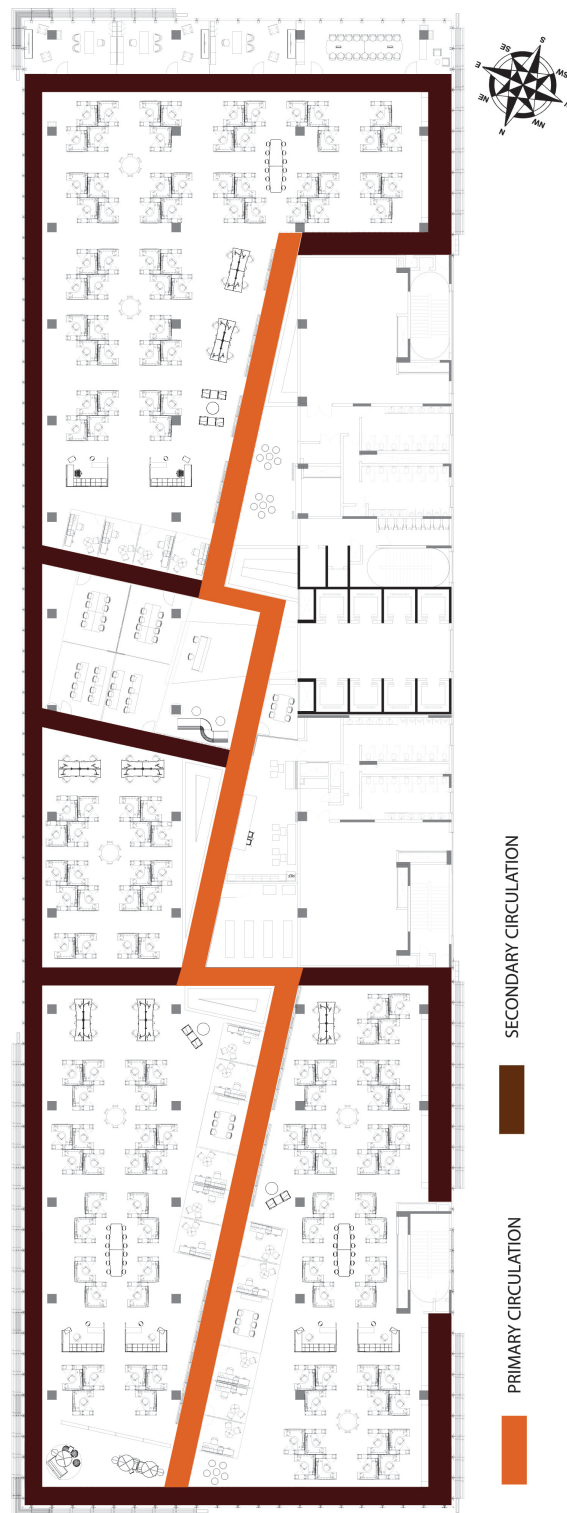


Figure 14- Floor plan showing primary and secondary circulation

Intimacy Gradient

As within a home, the relationship between the public areas and the private areas is most important. A sequence of placement, which corresponds to their degrees of privacy or accessibility to visitors or clients, creates a clearly defined gradient of intimacy that enhances the subtlety of social interaction in the space. Forms of connecting space bridge each of the main areas within the intimacy gradient. An arrival offers an introduction to the next space; a passage contains the movement as one travels from one spot to the next; and a transition allows one to adjust from one experience to another. The layout is planned such that an intimacy gradient is created with the entrance / reception being the most public part, then leading into the meeting areas and pantry, still considered public, offices and workspaces, slightly more private and finally to the private offices.

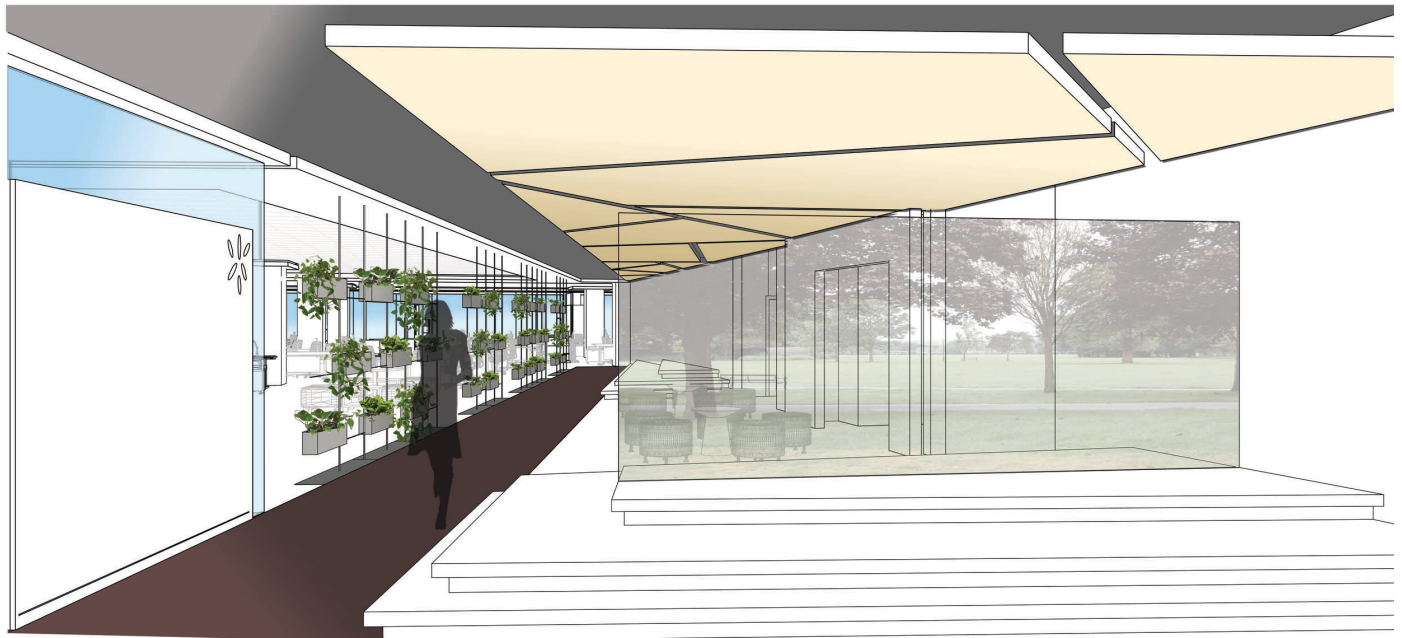


Figure 15- Intimacy gradient illustrated by sequence of movement

Main Gateway

Indian architectural precedents like the gateway arch into a town and the highly ornate doors indicating the entry into a house are reinterpreted here with a form reminiscent of the triumphal archway. Here the main entrance seeks to address three critical design issues: first, to make it intuitively clear where the main entrance is located by virtue of its dominating form; second, to define a route that feels natural and relatively direct by placing it in direct line of sight from the elevator lobby; and third, to tie to the circulation paths within, encouraging movement along the intended route. Hence the location of the main entrance controls the layout of the space and informs one's movement through it.



Figure 16- Entry into the space is marked by distinct form

Informal Activity Nodes

Informal areas with berms and break out spaces along the periphery act as nodes that are accessible to all, encouraging communication and informal meetings among employees. The tiered seating not only raises a person off the common path of movement, but also serves as a place of repose, outlook and community cohesiveness. Multiple nodes of activity / repose through the workspace are connected with the flow of movement that brings the work community through these spots as often as possible. Also, if the circulation path cuts through the common area the space will be too exposed and it will not be comfortable to linger there and settle down. The nodes are flanked by the common ambulatory pathway, which is open to them in passing. People can keep moving or step into the space if so suited.

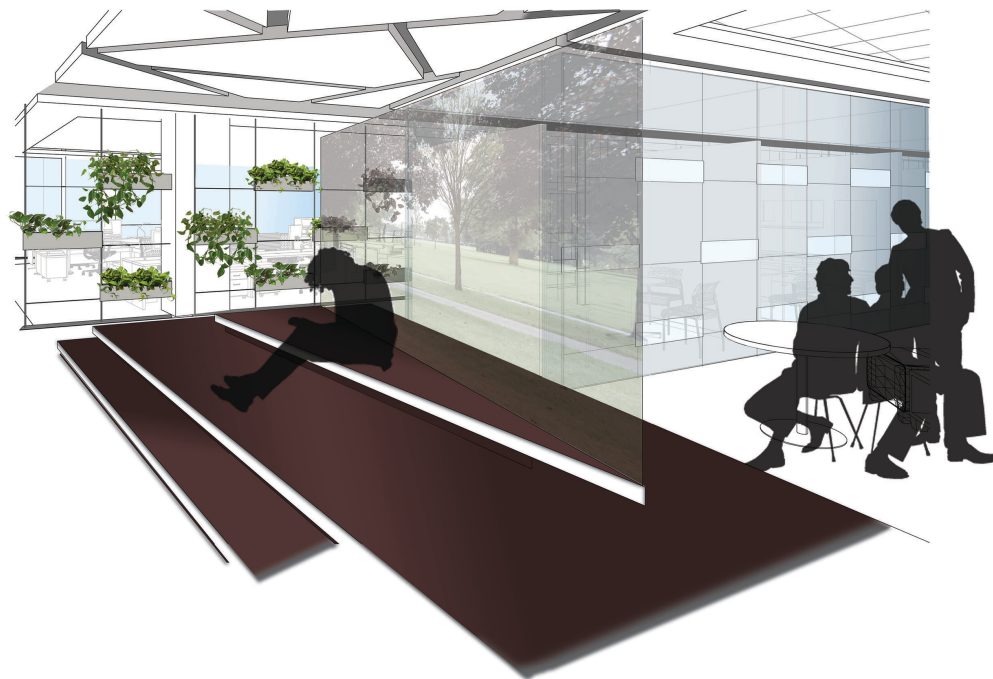


Figure 17- Nodes are distributed evenly throughout the workplace

Spatial Cluster

The current workforce generation benefits from openness that promotes social exchange, fostering a sense of belonging. This openness and the average Indian's existence within a community-loving society are addressed in terms of spatial clusters with the office. The workplace promotes interaction with flexible spaces interspersed within the work floor. Teams are formed and disbanded as needed, and when their projects require they are able to sit together as a concentrated cluster with easy access to gathering spaces. Work clusters are neither so scattered that any place is isolated from another, nor are they agglomerated that a single workplace is lost within a sea of others. Workspaces are grouped to form identifiable micro-communities that are small enough for face-to-face contact. Clusters of offices are arranged as a social organization that is decentralized and part of the work floor enabling a network of interaction between the managers and their teams.



Figure 18- Clusters help foster a sense of belonging

Degrees of Privacy

Distinct workspaces are created with the use of glass walls and 'living' screens that enhance the feeling of being among people, without cutting off the visual connection between the various groups, even when inside an enclosed space. At any point within the floor plan, the line of sight is not obstructed by an opaque partition and each area is planned in such a way that there is a view into a larger space. Private offices are integrated visually, within the work community, with the use of frosted-glass partitions that offer privacy without closing them off.



Figure 19- All work areas are visually accessible

Play of Light

Relentless uniform fluorescent light deprives a space of meaning that comes with variety. Controlling the amount of light that enters a space helps capture light, which in turn creates areas of light and shadow that add to the perception of the space. The interior spaces are designed in response to the sun, with its rooms located and organized so that all important spaces receive abundant and balanced light. Window walls are left open with offices placed away from the peripheral walls, so that natural light penetrates unhindered into the work floor. Light can direct and enhance our movement through space. As people tend to walk toward light, key points in the circulation system are kept systematically lighter than their surroundings by creating alternating areas of light and shade to increase the contrast. This interplay of dark and light fits together with the flow of movement. Screening devices are used to further create patterns of shadow that change during the course of the day.

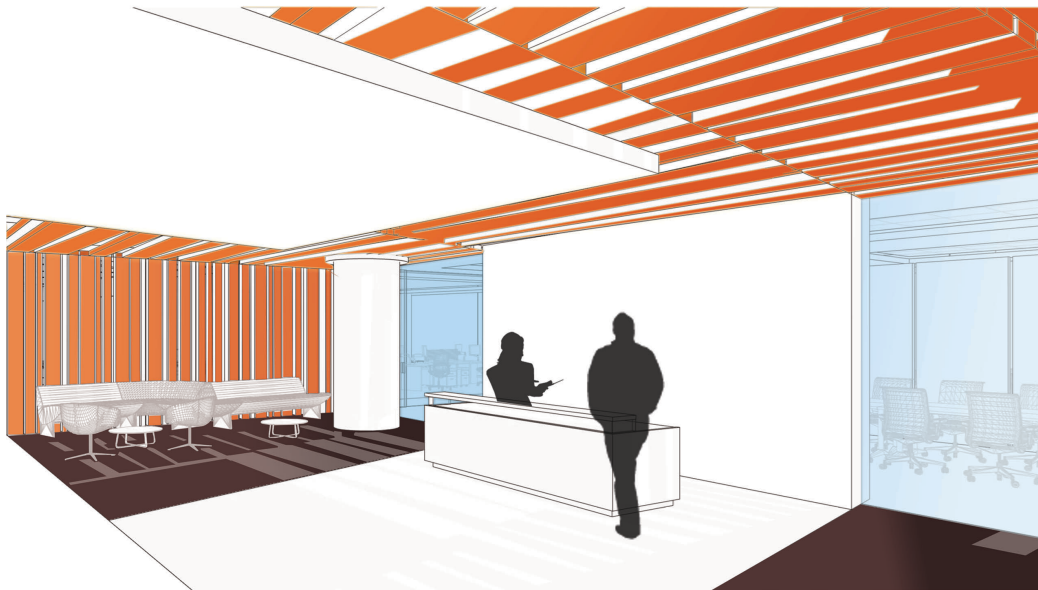


Figure 20- Alternating light and shadow creates a visual interest in the perception of space

CONCLUSION

The idea of critical regionalism and a pattern language has been in existence for quite a while. I was particularly influenced by the ideas of Christopher Alexander's book *A Pattern Language* and Kenneth Frampton's work on *Critical Regionalism*. These books helped articulate my thoughts regarding several patterns that I have experienced but may have not been able to clearly define.

Since independence in 1947 there has been a constant re-interpretation of Indian architecture as a cultural heritage and also as a representation of the indigenous society. There is a thin line between the desire for change and the need for preservation of one's identity. Yet, this does not mean that Western modes of modern practice should be ignored. An alliance of modern architecture and the theories behind ancient Indian architecture can influence a new approach to design, without destroying the old but instead integrating it with the advantages offered by modern Western technology.

The patterns highlighted in my study were selected to illustrate how indigenous architectural thought can influence and shape a cross-cultural space that is not familiar to the society that utilizes it. The logic of these patterns in turn enforces an aesthetic expression of one type of culture upon the unfamiliar structural organization of another, eventually making them mutually dependent. With the constant emphasis on sustainable building and human-centric design in the West, these patterns may be absorbed eventually into an amalgamated design language, generating a cohesive global pattern utilized in a context that is specifically pertinent to the culture of the society for which we build.

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